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FLOOD INSURANCE STUDY

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TOWN OF JAMAICA, VERMONT
WINDHAM COUNTY

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NOVEMBER 5, 1980

federal emergency management agency
federal insurance administration

COMMUNITY NUMBER - 500131

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PUBLISHED SEPARATELY:

Flood Insurance Rate Map Index

Flood Insurance Rate Map

FLOOD INSURANCE STUDY
TOWN OF JAMAICA, VERMONT

1.0 INTRODUCTION

1.1 Purpose of Study

The purpose of this Flood Insurance Study is to investigate the existence and severity of flood hazards in the Town of Jamaica, Windham County, Vermont, and to aid in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Initial use of this information will be to convert Jamaica to the regular program of flood insurance by the Federal Insurance Administration (FIA). Further use of the information will be made by local and regional planners in their efforts to promote sound land use and flood plain development.

1.2 Coordination

An initial Consultation and Coordination Officer's (CCO) meeting was held on June 28, 1977, between community officials, local and regional planners, and representatives of the FIA and Dufresne-Henry Engineering Corporation (the study contractor), in order to determine the areas to be studied in detail and those to be studied using approximate methods. An announcement of intent to perform a Flood Insurance Study for the Town of Jamaica appeared in the Brattleboro Reformer on October 7, 1977.

The Vermont Department of Water Resources and the Windham Regional Planning and Development Commission were notified of the study and requested to provide any pertinent information, including published or unpublished flood studies, flood plain regulations and floodway requirements. The Vermont Department of Highways was contacted to obtain any available topographic mapping of the study area. The U. S. Geological Survey (USGS) was contacted to obtain flood-prone area maps covering the area. The U. S. Army Corps of Engineers (COE) was contacted to obtain any information concerning the operation of the Ball Mountain Dam, as well as to obtain high-water marks for the West River and Winhall River. The community was requested to submit data concerning flood hazards, flooding experience, plans to avoid potential flood hazards, and any other data deemed appropriate. Periodic contacts were made with local officials to keep them informed on the progress of the study and to solicit pertinent information.

An intermediate CCO meeting was held on July 2, 1979, between local community officials and representatives of the FIA and the study contractor to resolve any problems before work proceeded. A

final CCO meeting was held on July 2, 1979, to provide an opportunity for community officials to become familar with the results of this study. Town residents and officials, as well as FIA and study contractor personnel, attended the final meeting.

1.3 Authority and Acknowledgements

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968, as amended.

The hydrologic and hydraulic analyses for this study were performed by Dufresne-Henry Engineering Corporation for the Federal Insurance Administration, under Contract No. H-4576. This work, which was completed in January 1979, covered all significant flooding sources in the Town of Jamaica.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Town of Jamaica, Windham County, Vermont. The area of study is shown on the Vicinity Map (Figure 1).

Detailed methods were used to study flooding on the following streams: the West River from the Jamaica-Townshend town line to the confluence with Ball Mountain Brook, the Winhall River from the Jamaica-Londonderry town line to the Jamaica-Winhall town line, Wardsboro Brook from its confluence with the West River to the Jamaica-Wardsboro town line, and Ball Mountain Brook from its confluence with the West River to a point 0.1 mile downstream of its confluence with the North Branch. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction for the next five years, through January 1984.

Portions of North Branch, Ball Mountain Brook, the West River, and Turkey Mountain Brook within the town's limits, were studied by approximate methods. Approximate methods of analysis were used to study those areas having low development potential and minimal flood hazards as identified at the initiation of the study. The scope and methods of study were proposed to and agreed upon by the FIA.

APPROXIMATE SCALE
0 1 2 3 MILES

VICINITY MAP

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF JAMAICA, VT
(WINDHAM CO.)

FIGURE 1

2.2 Community Description

The Town of Jamaica is located in the northwest portion of Windham County, in southern Vermont. Jamaica is bordered on the north by the Towns of Londonderry and Windham, on the east by the Town of Townshend, on the south by the Town of Wardsboro, and on the west by the Towns of Stratton and Winhall.

The 1975 population of 715 represents a 21-percent increase over the 1970 figure. This growth rate was nearly four and a half times greater than the percentage increase for Windham County as a whole during the same length of time (Reference 1).

The Town of Jamaica lies within the physiographic region known as the Green Mountains. The Green Mountains are formed of metamorphic and crystalline rock ranging in age from Pre-Cambrian quartzite to Ordivician marble. Over a massive crystalline core, the Green Mountains form a broad, inverted fold or "anticlinorium" extending the full length of Vermont and beyond into Quebec, Canada (Reference 2).

While the summits of the mountains above 3,100 feet are generally free of glacial drift, below this elevation a nearly continuous veneer of glacial deposits is found in various thicknesses. Below 2,000 feet, lake sediments and kamen gravels are frequently found on the slopes. Mountain soils here are typically rough and stony and are invariably acidic. In soils at higher elevations, greater organic content increases moisture retention.

Rainfall increases greatly with elevation in the Green Mountains, reaching a maximum of well over 50 inches per year. Similarly, snowfall is greatly increased in this area, reaching a maximum of over 120 inches in the southern part of the range. Adiabatic cooling averages about 3.4 degrees Fahrenheit per 1,000 feet, and the growing season at an elevation of 3,000 feet is approximately 90 days. The north-facing slopes of the Green Mountains undoubtedly have the most severe climate in the state.

Northern hardwood associations, dominated by sugar maple and beech, prevail at elevations below 2,400 feet. Above this level, up to an elevation of 3,000 feet, forest types change to yellow birch, white birch and red spruce. Above 3,000 feet, red spruce and balsam fir dominate. At still higher elevations, ground cover of mosses, ferns, and low shrubs such as blueberry and cranberry are prevalent.

2.3 Principal Flood Problems

The Town of Jamaica experienced severe floods in 1869, 1927, 1936, 1938, 1948, 1973, and 1976. Minor flooding occurs nearly every spring as melting snow, combined with spring rainfall, flows from the surrounding mountains.

While little is actually documented about the great flood of 1869, this was probably the worst to occur in Jamaica. As far as can be determined, the 1869 flood was higher than either the 1927 or 1938 floods (Reference 3). During the flood, the covered bridge over Ball Mountain Brook at the foot of Depot Street was washed out, taking Mr. William Carr, his horse, and his carriage with it (Reference 4).

In November 1927, a total of 4.12 inches of rain fell in Jamaica over a 24-hour period. The resulting flood destroyed 12 bridges, made roads impassable, washed out two mill dams and left a lumber yard strewn with debris.

In March 1936, the people of Jamaica awoke to the sounds of rushing water, breaking ice, and crashing boulders as Ball Mountain Brook carried the floodwaters resulting from a 3-inch rainfall coupled with a rapid thaw. Damage included the loss of seven bridges on the West Jamaica-Pike's Falls Road. Two years later, in 1938, the floodwaters rose again, after five days of steady rainfall were capped by a hurricane which dumped 3 inches of rain. In Jamaica, only foot traffic was possible, there was no electric or telephone service, and 12 bridges were washed downstream. Water flowed 3 to 5 feet deep on Back Street (which had formerly been named Water Street).

The next major flood to hit Jamaica was in 1948. Back Street was gutted and 14 residents had to leave their homes. One year later Ball Mountain Brook undermined a home 2 miles above the town. Two other floods of similar magnitude occurred, one in 1973 and the other in 1976. The 1976 flood was somewhat worse, with 5.5 inches of rain falling on Jamaica. At least 15 families along Pike's Fall Road had to be evacuated as some 20 houses were undermined. Jamaica was the hardest-hit community in the region (Reference 5).

2.4 Flood Protection Measures

In 1961, the Ball Mountain Dam on the West River in north-central Jamaica was completed, as part of an overall flood-control system for the headwaters of the Connecticut River. This has also had a

significant effect on flood levels in the Town of Jamaica. In comparing the 1973 flood with previous floods, the COE found that this dam has reduced the flood levels in the town by about 8 feet (Reference 6).

There were no other flood-control structures either existing or authorized in the Town of Jamaica at the time of this study.

The National Oceanic and Atmospheric Administration (NOAA) of the U. S. Department of Commerce maintains year-round surveillance of weather conditions in the Jamaica area. Flood warnings and statements of anticipated weather conditions are issued by the National Weather Service in Burlington, Vermont, and by the River Forecast Center in Bloomfield, Connecticut, to radio and television stations and the local press for broadcast to the public. During floods or potential flood periods the National Weather Service releases, as necessary, forecasts of the high-water elevations that may be expected at the stream gaging stations operated by the USGS along the West River, near Ball Mountain Brook and near Townshend Dam.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Floods having recurrence intervals of 10, 50, 100, and 500 years have been selected as having special significance for flood plain management and for flood insurance premium rates. The analyses reported here reflect current conditions in the watersheds of the flooding sources.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for floods of the selected recurrence intervals for each flooding source studied in detail in the Town of Jamaica.

Peak discharge computations for the West River were based on the HEC-1 flood hydrograph routing computer analysis developed by the COE (Reference 7). Peak discharge computations for the other detailed study streams were based on a regional method developed by the USGS which relates flood flows to drainage areas, hydrologic areas, and flood-frequency regions, by statistical manipulation of known discharges along selected rivers (Reference 8).

Drainage area-peak discharge relationships for the West River, Ball Mountain Brook, Wardsboro Brook and the Winhall River in Jamaica, Vermont, are shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
WEST RIVER[1]					
Above confluence of Ball Mountain Brook	182.1	5,000	6,000	7,000	25,000
Above confluence of Turkey Mountain Brook	218.8	5,566	10,125	12,573	25,000
Above confluence of Wardsboro Brook	233.8	6,984	13,041	15,975	25,794
At corporate limits	269.2	11,736	21,555	26,555	41,832
WARDSBORO BROOK					
At confluence with West River	35.1	4,800	8,600	10,600	16,200
BALL MOUNTAIN BROOK					
At confluence with West River	33.7	5,100	9,300	11,500	19,000
WINHALL RIVER					
At confluence with West River	43.3	7,100	13,200	16,300	26,000

[1]Flows along West River controlled by Ball Mountain Dam.

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of the flooding sources studied in detail were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along each of these flooding sources.

Water-surface elevations of floods of the selected recurrence intervals were computed through use of the COE HEC-2 step-backwater computer program (Reference 9). In order to perform the backwater analysis and to compute critical backwater effects, it was necessary to survey flood plain cross sections and measure the geometry of bridges,

dams, and culverts in the field. Cross sections were located at close intervals above and below bridges, culverts, and other hydraulic structures in order to compute the significant backwater effects of these structures. In long reaches between structures, appropriate valley sections were also surveyed. Cross-section data for the streams studied in detail in the community were obtained by field measurement. All bridges and culverts were field-surveyed to obtain structural geometry. Starting water-surface elevations on all the study streams in Jamaica were determined by the slope/area method.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals. Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway is computed (Section 4.2), selected cross-section locations are also shown on the Flood Boundary and Floodway Map (Exhibit 3).

Roughness coefficients (Manning's "n" values) were assigned on the basis of field inspection and compared with the values contained in published reports (References 10 and 11). The ranges of "n" values used in the hydraulic analyses are listed below.

Stream	Channel "n" Range	Overbank "n" Range
West River	0.03 -0.04	0.015-0.15
Wardsboro Brook	0.035-0.055	0.015-0.15
Ball Mountain Brook	0.045-0.065	0.015-0.15
Winhall River	0.03 -0.065	0.015-0.15

All elevations used in this study are referenced to the National Geodetic Vertical Datum of 1929 (NGVD), formerly referred to as Sea Level Datum of 1929. Locations of the elevation reference marks used in the study are shown on the maps.

The hydraulic analyses for this study are based on the effects of unobstructed flow. The flood elevations shown on the profiles are valid only if hydraulic structures remain unobstructed, and dams and other flood control structures operate properly and do not fail.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

A prime purpose of the National Flood Insurance Program is to encourage state and local governments to adopt sound flood plain management programs. Each Flood Insurance Study, therefore, includes a flood boundary

map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the FIA as the base flood for purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the boundaries of the 100- and 500-year floods have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using topographic maps enlarged to a scale of 1:9,600 with a contour interval of 20 feet (References 12 and 13). In cases where the 100- and 500-year flood boundaries are close together, only the 100-year boundary has been shown.

The boundaries of the 100- and 500-year floods are shown on the Flood Boundary and Floodway Map (Exhibit 3). Small areas within the flood boundaries may lie above the flood elevations and, therefore, may not be subject to flooding. Owing to limitations of the map scale and lack of detailed topographic data, such areas are not shown.

The 100-year flood boundaries for the streams and portions of streams studied by approximate methods were delineated using the Flood Hazard Boundary Map for the Town of Jamaica (Reference 14).

4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity, increases the flood heights of streams, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent flood plain areas that must be kept free of encroachment in order that the 100-year flood can be carried without substantial increases in flood heights. Minimum standards of the FIA limit such increases in flood heights to 1.0 foot, provided that hazardous velocities are

not produced. The floodways in this report are presented to local agencies as minimum standards that can be adopted or that can be used as a basis for additional studies.

The floodways presented in this study were computed on the basis of equal conveyance reduction from each side of the flood plains. The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway is computed (Table 2).

As shown on the Flood Boundary and Floodway Map (Exhibit 3), the floodway widths were determined at cross sections; between cross sections, the boundaries were interpolated. In cases where the boundaries of the floodway and the 100-year flood are either close together or collinear, only the floodway boundary has been shown.

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 2.

A portion of the floodway computed for the Winhall River lies outside the town's corporate limits.

5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the FIA has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors (FHFs), and flood insurance zone designations for each flooding source affecting the Town of Jamaica.

5.1 Reach Determinations

Reaches are defined as lengths of watercourses having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference does not have a variation greater than that indicated in the following table for more than 20 percent of the reach.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
West River								
A	1,400[1]	250	1726.5	15.4	546.2	546.2	546.2	0.0
B	2,500[1]	286	2123.5	7.5	551.5	551.5	552.1	0.6
C	6,400[1]	700	2882.0	4.4	568.2	568.2	568.5	0.3
D	7,700[1]	367	1201.2	10.5	578.9	578.9	578.9	0.0
E	8,750[1]	181	1365.7	9.2	583.3	583.3	583.3	0.0
F	9,380[1]	218	1386.3	9.1	585.7	585.7	585.7	0.0
G	10,300[1]	116	822.0	15.3	595.7	595.7	595.7	0.0
H	12,260[1]	883	1282.0	9.8	609.9	609.9	609.9	0.0
I	14,360[1]	702	1183.1	10.6	630.7	630.7	630.7	0.0
J	17,530[1]	201	1362.1	9.2	655.1	655.1	655.3	0.2
K	18,380[1]	147	1055.1	6.6	658.2	658.2	658.4	0.2
Wardsboro Brook								
A	738[2]	532	3772.2	2.8	560.0	560.0	560.8	0.8
B	1,438[2]	77	641.0	16.5	566.4	566.4	566.4	0.0
C	2,038[2]	115	778.0	13.6	576.5	576.5	576.5	0.0
D	3,538[2]	127	756.0	14.0	607.9	607.9	607.9	0.0
E	4,388[2]	104	711.2	14.9	629.4	629.4	629.4	0.0
F	4,988[2]	67	611.4	17.3	642.7	642.7	643.3	0.6

[1]Feet above corporate limits
[2]Feet above confluence with West River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF JAMAICA, VT
(WINDHAM CO.)

FLOODWAY DATA

WEST RIVER AND WARDSBORO BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Wardsboro Brook (continued)								
G	5,738	95	688.4	15.4	661.1	661.1	661.1	0.0
H	6,538	79	645.0	16.4	672.5	672.5	672.5	0.0
I	7,071	106	767.0	13.8	681.3	681.3	681.4	0.1
J	7,751	168	832.0	12.7	695.8	695.8	695.9	0.1
K	9,051	96	693.5	15.3	718.7	718.7	718.7	0.0
L	10,171	112	726.0	14.6	740.2	740.2	740.8	0.6
M	12,011	82	659.6	16.1	767.2	767.2	767.2	0.0
N	13,211	112	722.2	14.7	788.0	788.0	788.0	0.0
O	14,111	84	660.5	16.0	803.0	803.0	803.0	0.0
P	15,211	111	721.1	14.7	832.2	832.2	832.2	0.0
Q	16,931	119	737.7	14.4	868.8	868.8	868.8	0.0
R	17,471	79	650.7	16.3	886.5	886.5	886.6	0.1
S	18,371	104	782.0	13.6	901.5	901.5	901.5	0.0
T	18,856	64	642.0	16.5	910.0	910.0	910.0	0.0
Ball Mountain Brook								
A	1,020	107	850	13.5	680.8	680.8	681.8	1.0
B	1,200	128	802	14.3	689.4	689.4	689.4	0.0

[1]Feet above confluence with West River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF JAMAICA, VT
(WINDHAM CO.)

FLOODWAY DATA

WARDSBORO BROOK AND BALL MOUNTAIN BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Ball Mountain Brook (continued)								
C	1,540	80	689	16.7	693.4	693.4	693.4	0.0
D	2,020	85	700	16.4	704.9	704.9	704.9	0.0
E	2,720	88	712	16.2	721.3	721.3	721.3	0.0
F	3,190	66	645	17.8	730.4	730.4	730.4	0.0
G	3,770	111	791	14.5	746.7	746.7	746.7	0.0
H	4,330	114	771	14.9	756.2	756.2	756.2	0.0
I	5,450	78	680	16.9	785.1	785.1	785.1	0.0
J	6,470	85	699	16.4	812.7	812.7	812.7	0.0
K	7,110	71	742	15.5	828.7	828.7	828.9	0.2
L	7,340	84	1156	9.9	837.7	837.7	837.7	0.0
M	8,240	153	853	13.5	853.9	853.9	853.9	0.0
N	10,040	105	752	15.3	893.2	893.2	893.2	0.0
O	11,100	95	729	15.8	929.9	929.9	929.9	0.0
P	12,200	104	812	14.2	951.3	951.3	951.8	0.5
Q	12,660	66	644	17.9	961.3	961.3	961.3	0.0
R	13,000	113	769	14.9	978.2	978.2	978.3	0.1
S	14,100	131	1175	9.8	995.5	995.5	996.2	0.7
T	14,820	103	744	15.5	1011.1	1011.1	1011.1	0.0

[1]Feet above confluence with West River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF JAMAICA, VT
(WINDHAM CO.)

FLOODWAY DATA

BALL MOUNTAIN BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Winhall River								
A	0	250[2]	1578.0	10.3	1052.0	1052.0	1053.0	1.0
B	320	250[2]	1434.0	11.4	1059.0	1059.0	1059.0	0.0
C	455	250[2]	1938.0	8.4	1063.0	1063.0	1063.1	0.1
D	1,500	250	1754.0	9.3	1075.5	1075.5	1075.5	0.0
E	2,700	280	1839.0	8.9	1084.0	1084.0	1084.7	0.7
F	4,000	233	1672.0	9.7	1098.5	1098.5	1098.5	0.0
G	5,500	250	1450.0	11.2	1116.6	1116.6	1117.1	0.5
H	6,340	251	1369.0	11.9	1131.1	1131.1	1131.1	0.0
I	6,530	250	2161.3	7.5	1136.5	1136.5	1137.1	0.6
J	7,060	250	1293.1	12.6	1141.2	1141.2	1141.2	0.0
K	8,520	250	1373.7	11.9	1163.5	1163.5	1163.9	0.4
L	8,900	435	1925.0	8.5	1173.1	1173.1	1173.1	0.0
M	9,340	300	1409.0	11.6	1175.1	1175.1	1175.1	0.0
N	10,640	124	1053.3	15.5	1192.5	1192.5	1192.7	0.2
O	11,340	150	1385.3	17.8	1205.8	1205.8	1205.8	0.0
P	11,700	139	1639.3	9.9	1218.6	1218.6	1218.7	0.1
Q	12,820	150	1249.1	13.0	1235.2	1235.2	1235.3	0.1

[1]Feet above corporate limits
[2]This width extends beyond corporate limits

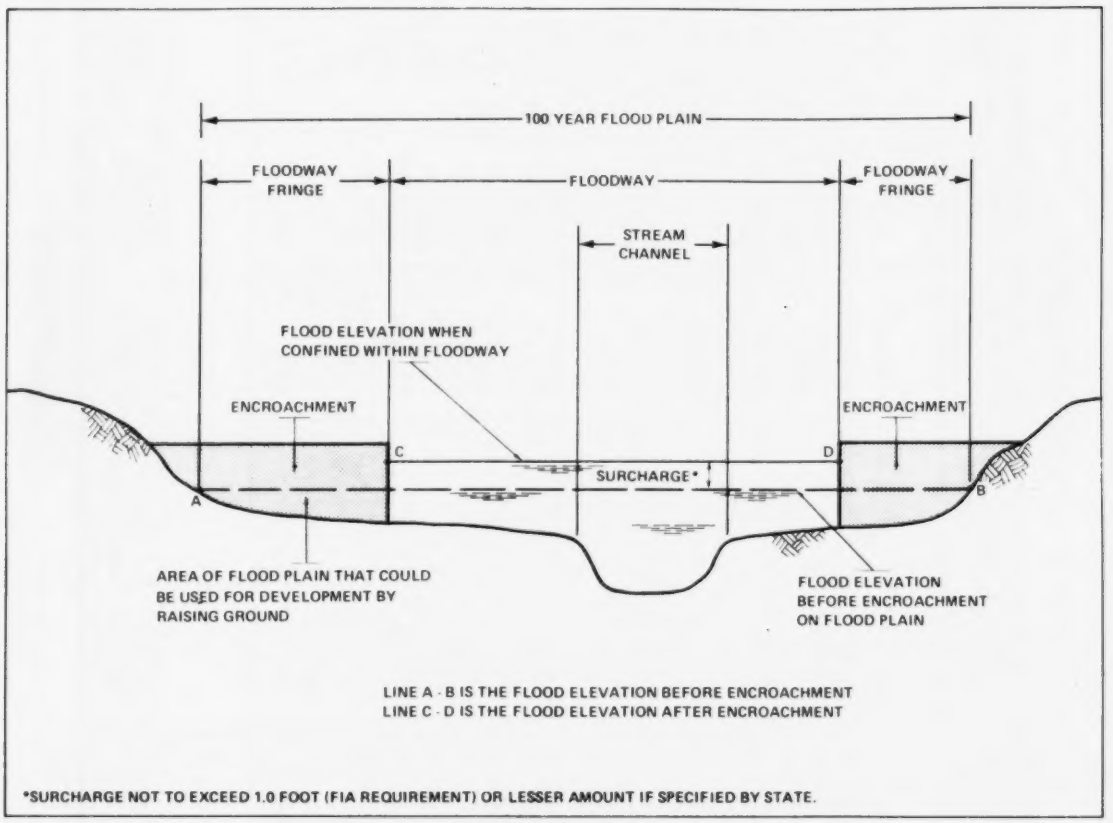
TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF JAMAICA, VT
(WINDHAM CO.)

FLOODWAY DATA

WINHALL RIVER


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A - B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C - D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FIA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

FLOODWAY SCHEMATIC Figure 2

Average Difference Between 10- and 100-Year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

The locations of the reaches determined for the flooding sources of Jamaica are shown on the Flood Profiles (Exhibit 1) and are summarized in the Flood Insurance Zone Data Table (Table 3).

5.2 Flood Hazard Factors

The FHF is the FIA device used to correlate flood information with insurance rate tables. Correlations between property damage from floods and their FHFs are used to set actuarial insurance premium rate tables based on FHFs from 005 to 200.

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FHF	ZONE	BASE FLOOD ELEVATION[3] (NGVD)
		10% (10 YR.)	2% (50 YR.)	0.2% (500 YR.)			
West River							
Reach 1	30	-3.0	-0.8	+2.4	030	A6	Varies
Wardsboro Brook							
Reach 1	30	-3.1	-0.9	+2.4	030	A6	Varies
Ball Mountain Brook							
Reach 1	30	-4.0	-1.3	+2.6	040	A8	Varies
Winhall River							
Reach 1	10	-3.0	-0.9	+2.2	030	A6	Varies
Reach 2	10	-3.7	-0.9	+2.9	035	A7	Varies

[1]Flood Insurance Rate Map Panel
[2]Weighted average
[3]Rounded to the nearest foot - see map

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF JAMAICA, VT
(WINDHAM CO.)

FLOOD INSURANCE ZONE DATA

WEST RIVER, WARDSBORO BROOK, BALL MOUNTAIN BROOK AND WINHALL RIVER

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest 0.5 foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the FHF is to the nearest foot.

5.3 Flood Insurance Zones

After the determination of reaches and their respective FHFs, the entire incorporated area of the Town of Jamaica was divided into zones, each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

Zone A:	Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations shown or FHFs determined.
Zones A6, A7, A8:	Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevations shown, and zones subdivided according to FHF.
Zone B:	Areas between the Special Flood Hazard Area and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control structure; also, areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.
Zone C:	Areas of minimal flooding.

Table 3, "Flood Insurance Zone Data," summarizes the flood elevation differences, FHFs, flood insurance zones, and base flood elevations for the flooding sources studied in detail in the Town of Jamaica.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the Town of Jamaica is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the FIA.

6.0 OTHER STUDIES

Flood Insurance Studies for the neighboring towns of Wardsboro, Londonderry, and Townshend are underway (References 15, 16, and 17). Continual coordination of information was maintained in the preparation of these studies, to ensure consistency and agreement of results across municipal boundaries.

This study is authoritative for purposes of the Flood Insurance Program, and the data presented here either supersede or are compatible with previous determinations.

7.0 LOCATION OF DATA

Survey, hydrologic, hydraulic, and other pertinent data used in this study can be obtained by contacting the office of the Insurance and Mitigation Division of the Federal Emergency Management Agency, Regional Director, Region I Office, J. W. McCormack Post Office and Courthouse Building, Room 462, Boston, Massachusetts 02109.

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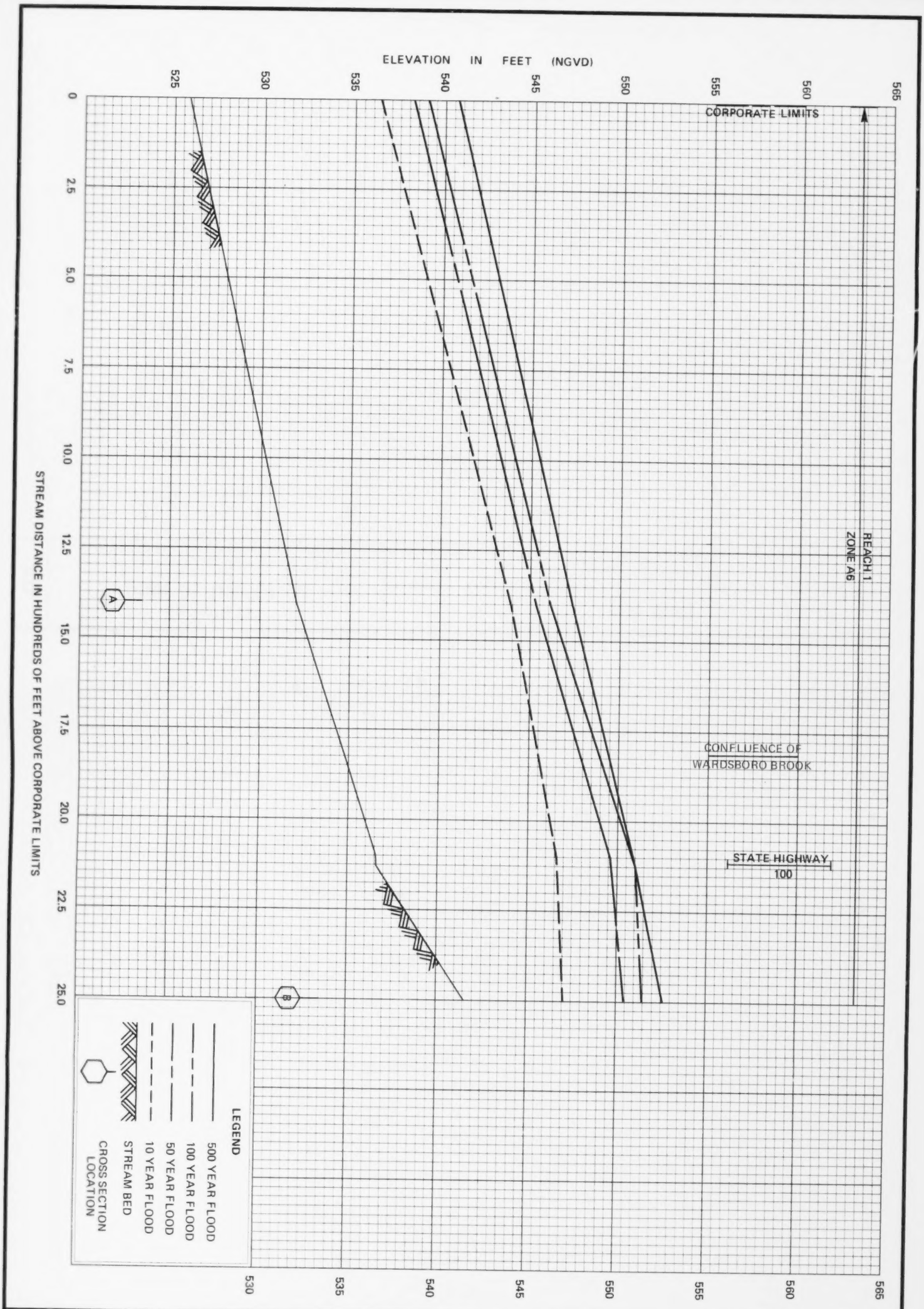


FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF JAMAICA, VT
(WINDHAM CO.)

FLOOD PROFILES

WEST RIVER

01P

REACH 1
ZONE A6

ELEVATION IN FEET (NGVD)

590
580
570
560
550
540

25 30 35 40 45 50 55 60 65 70 75 80

STREAM DISTANCE IN HUNDREDS OF FEET ABOVE CORPORATE LIMITS

C

D

LEGEND

- 500 YEAR FLOOD
- 100 YEAR FLOOD
- 50 YEAR FLOOD
- 10 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

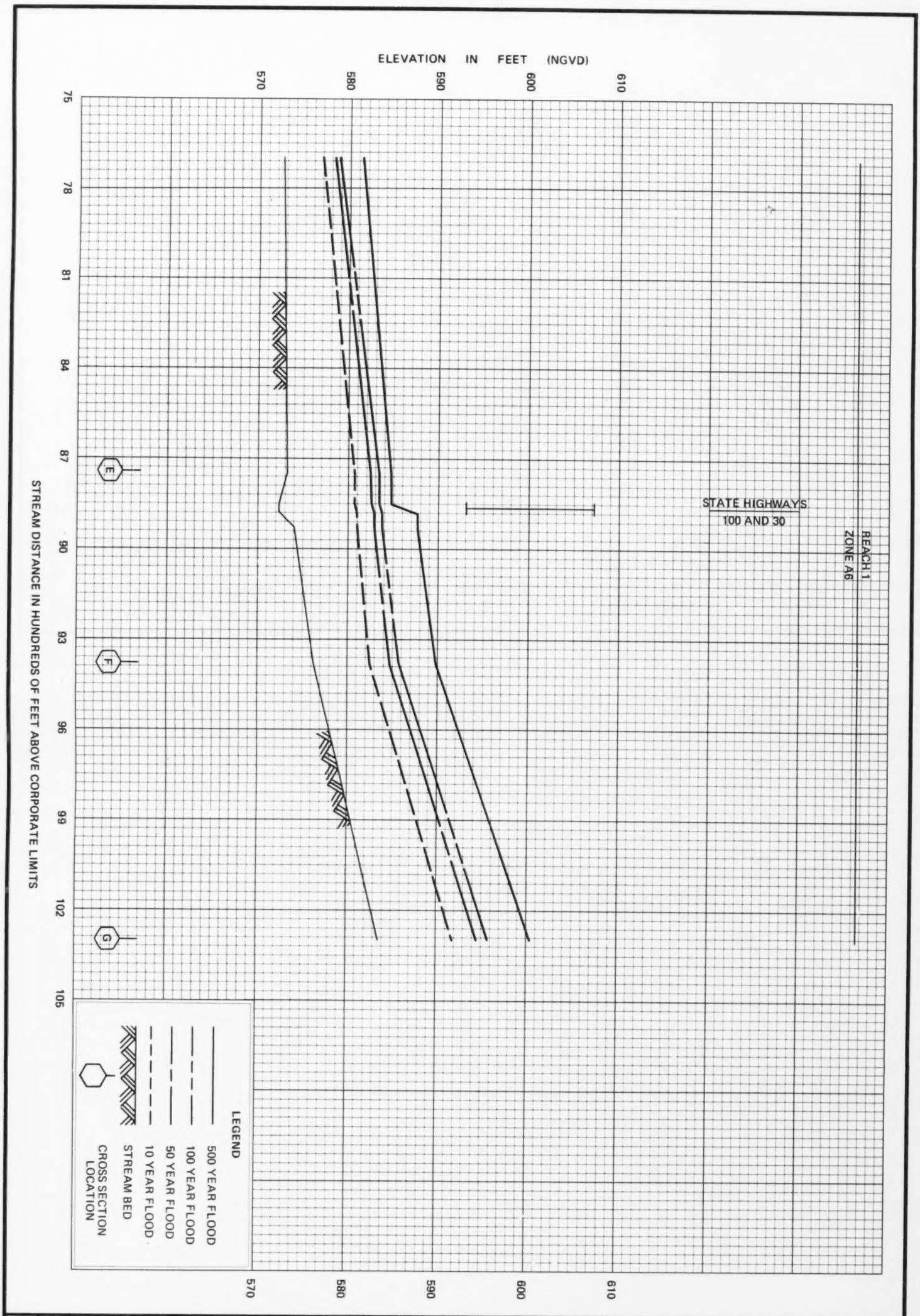
FLOOD PROFILES

WEST RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF JAMAICA, VT
(WINDHAM CO.)

02P



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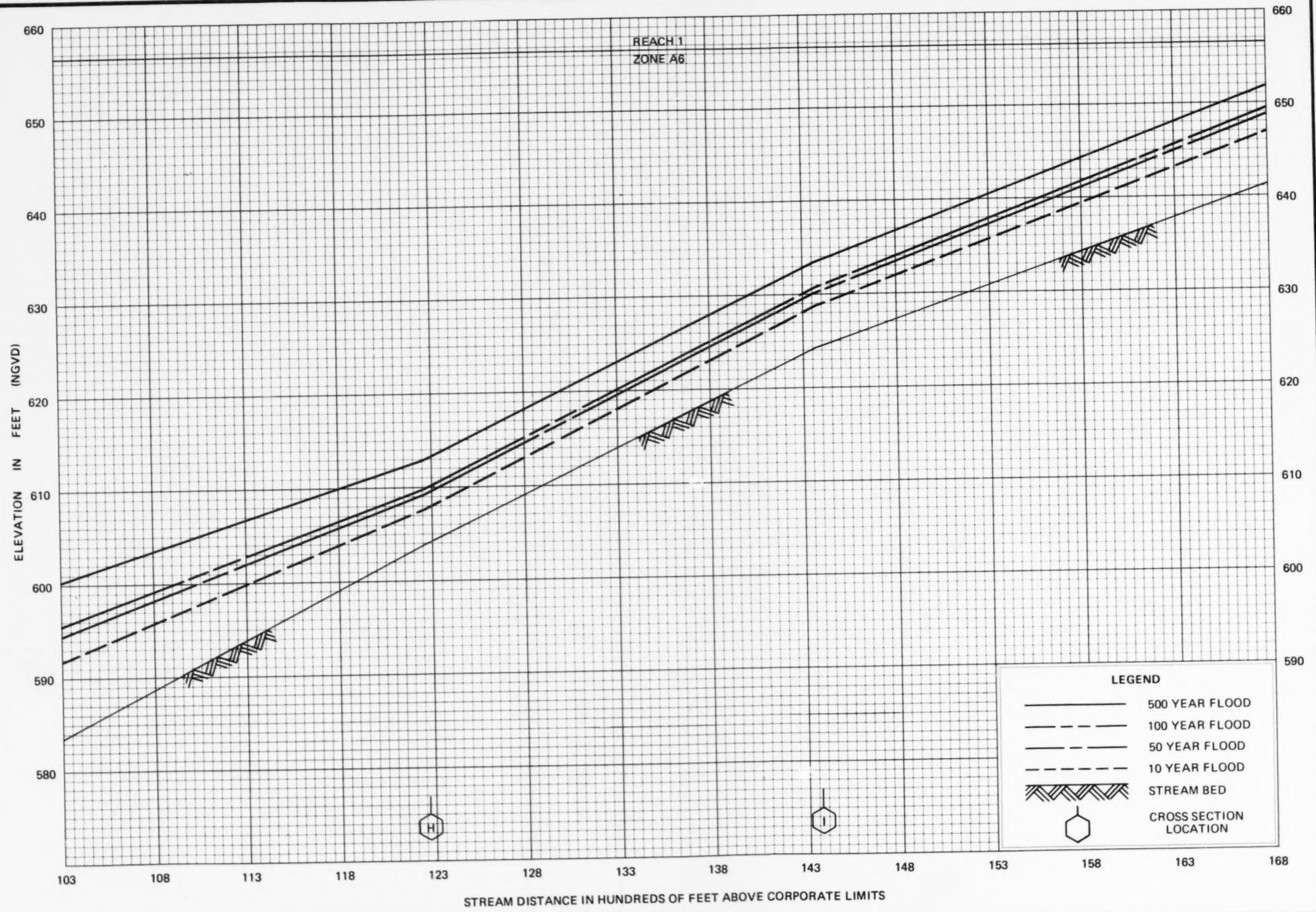
TOWN OF JAMAICA, VT
(WINDHAM CO.)

FLOOD PROFILES

WEST RIVER



FLOOD PROFILES

WEST RIVER

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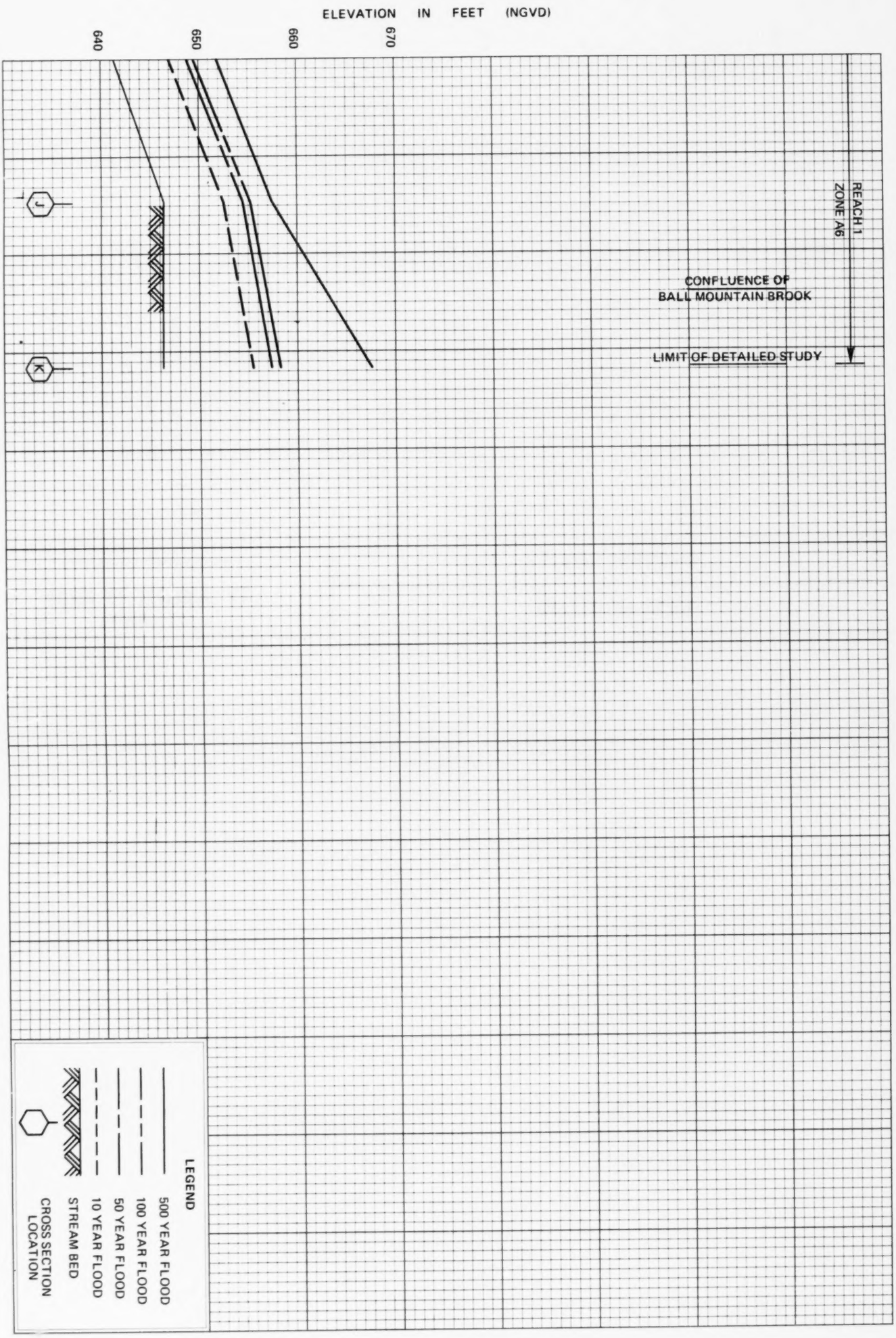
TOWN OF JAMAICA, VT
(WINDHAM CO.)

04P



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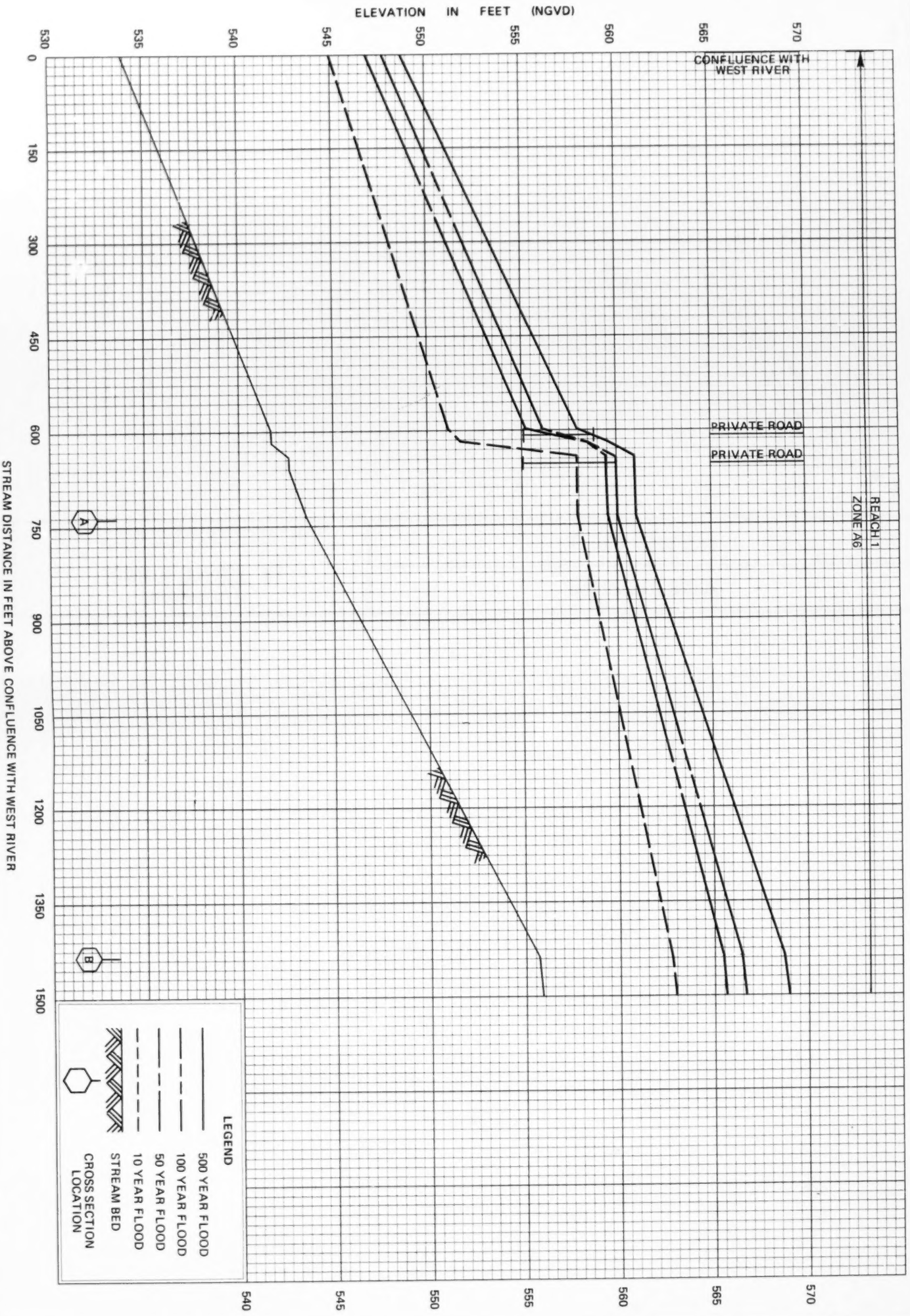
(WINDHAM CO.)

FLOOD PROFILES

WEST RIVER



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TOWN OF JAMAICA, VT
(WINDHAM CO.)

FLOOD PROFILES

WARDSBORO BROOK

FLOOD PROFILES

WARDSBORO BROOK

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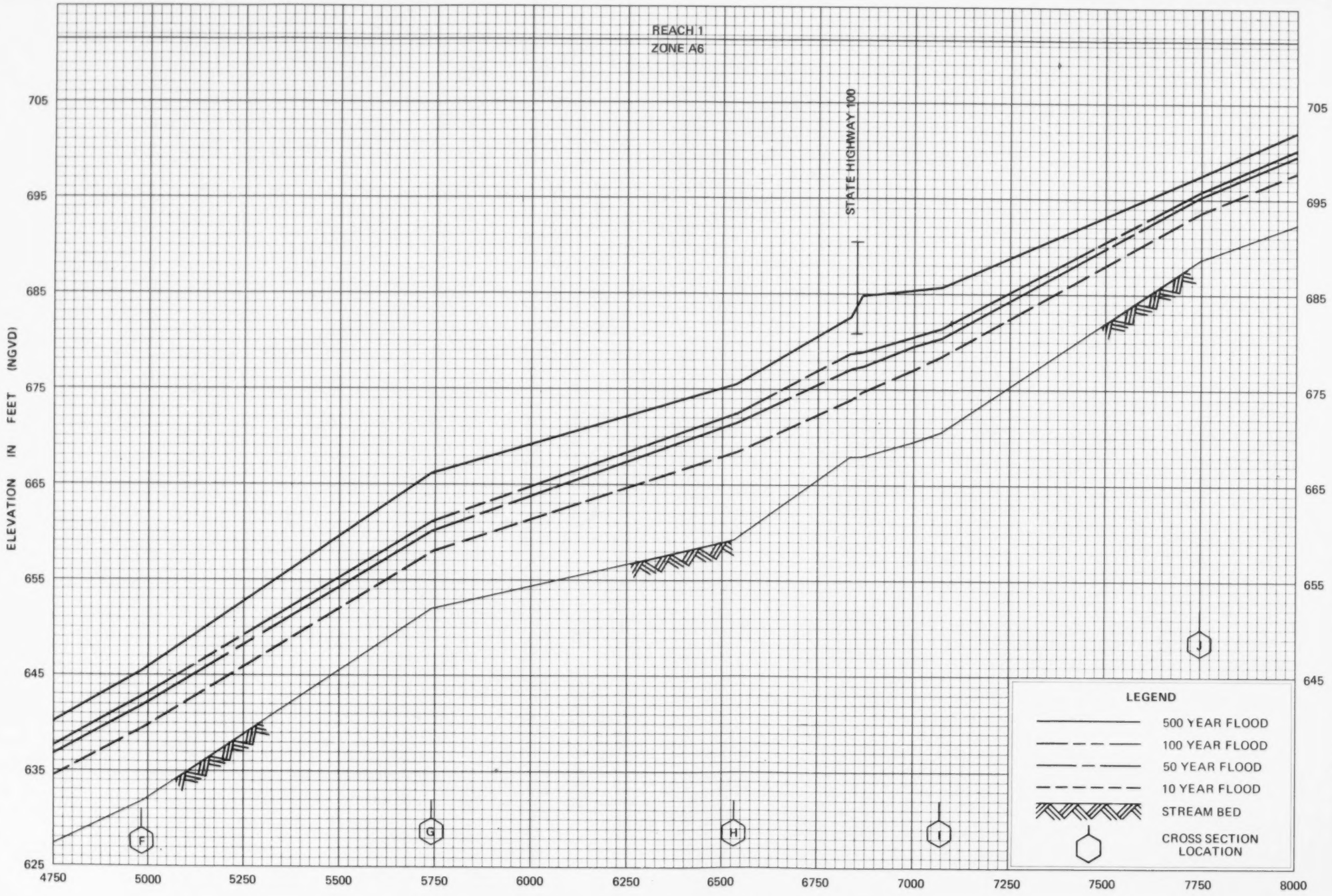
TOWN OF JAMAICA, VT
(WINDHAM CO.)

07P



FLOOD PROFILES

WARDSBORO BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF JAMAICA, VT
(WINDHAM CO.)

08P

REACH 1
ZONE A6

765
755
745
735
725
715
705
695
685

ELEVATION IN FEET (NGVD)

8000 8250 8500 8750 9000 9250 9500 9750 10000 10250 10500 10750 11000 11250

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH WEST RIVER

K

L

LEGEND

500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
CROSS SECTION LOCATION

FLOOD PROFILES

WARDSBORO BROOK

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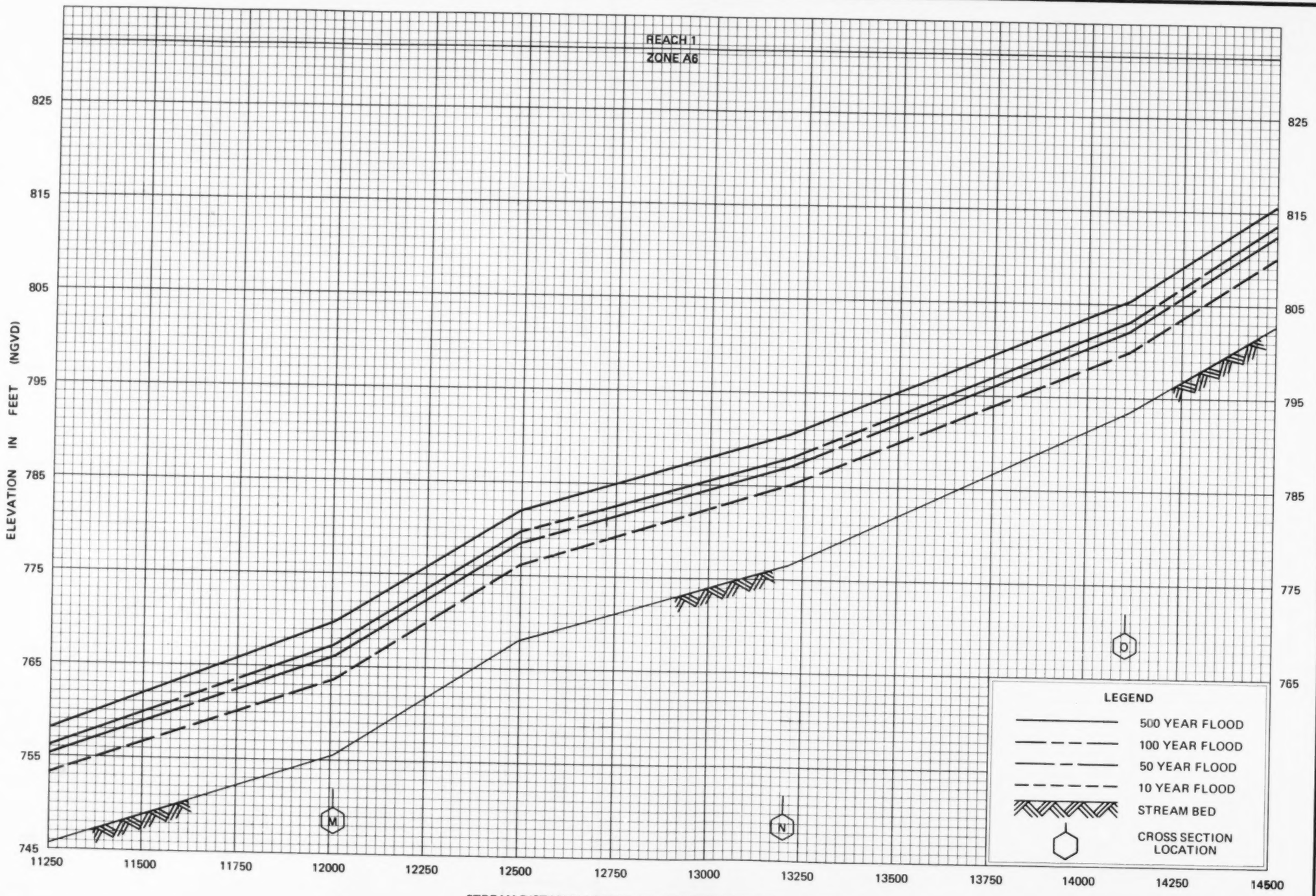

FLOOD PROFILES

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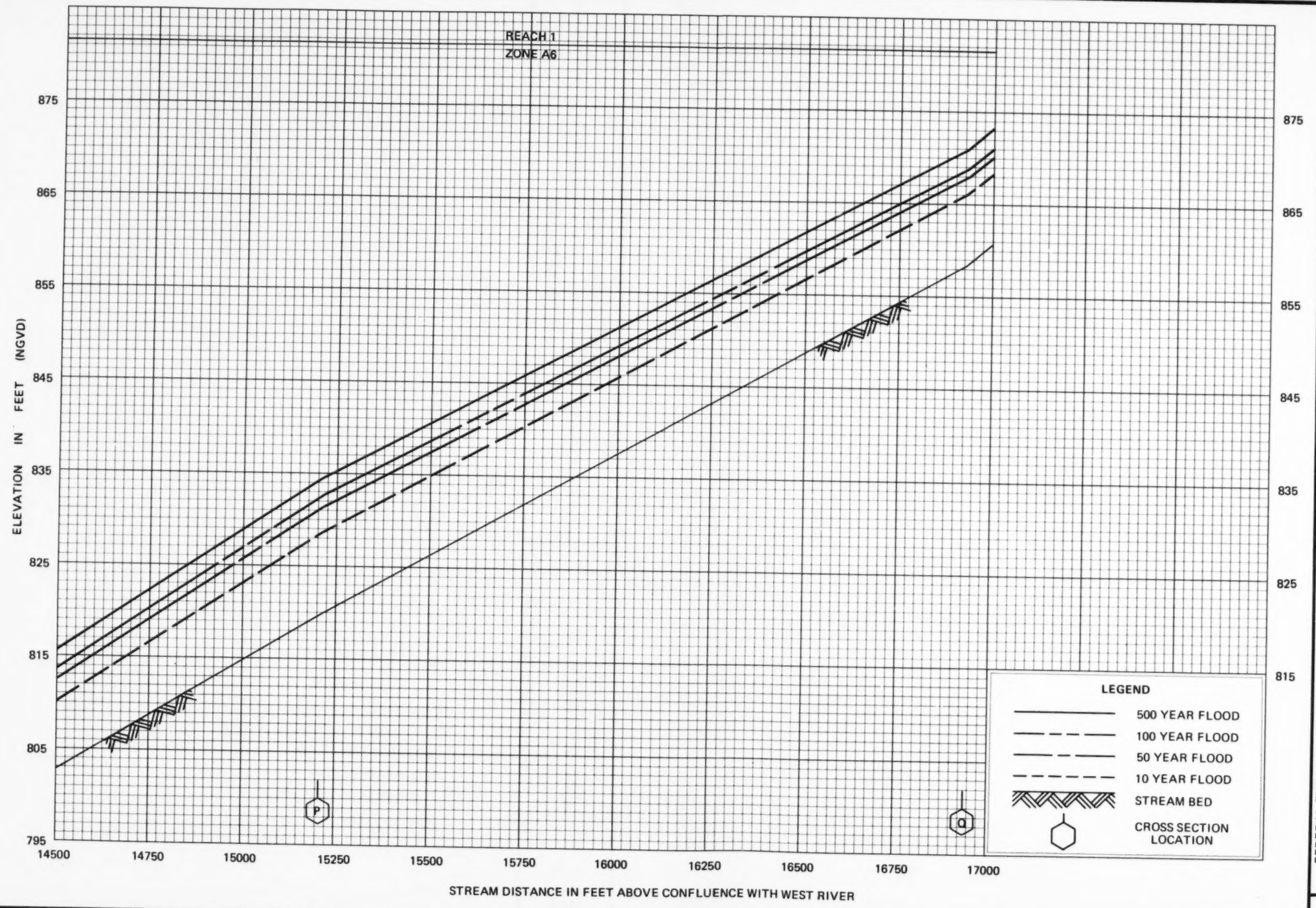

FLOOD PROFILES

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11P

FLOOD PROFILES

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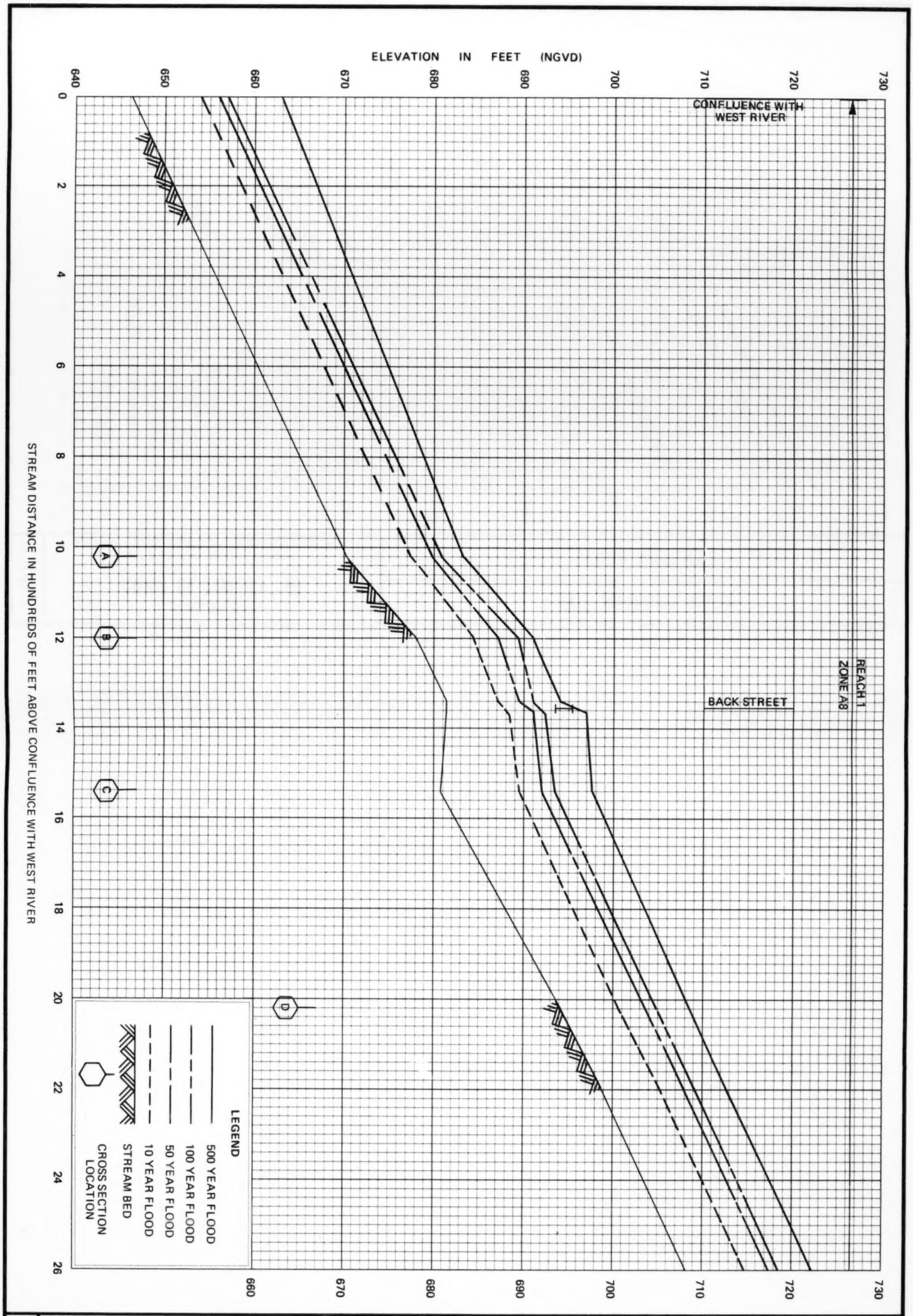

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FLOOD PROFILES

BALL MOUNTAIN BROOK

FLOOD PROFILES

BALL MOUNTAIN BROOK

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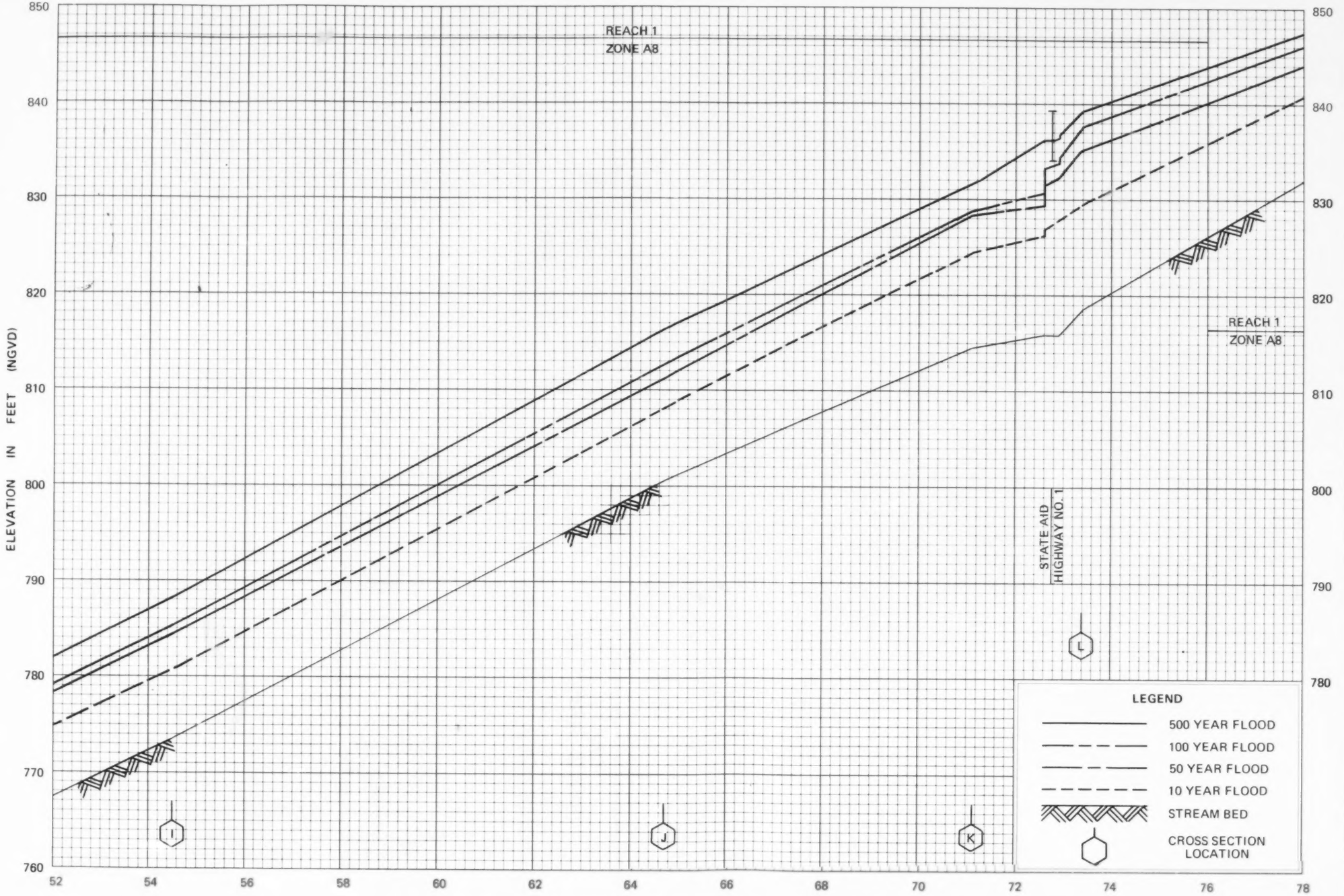

FLOOD PROFILES

BALL MOUNTAIN BROOK

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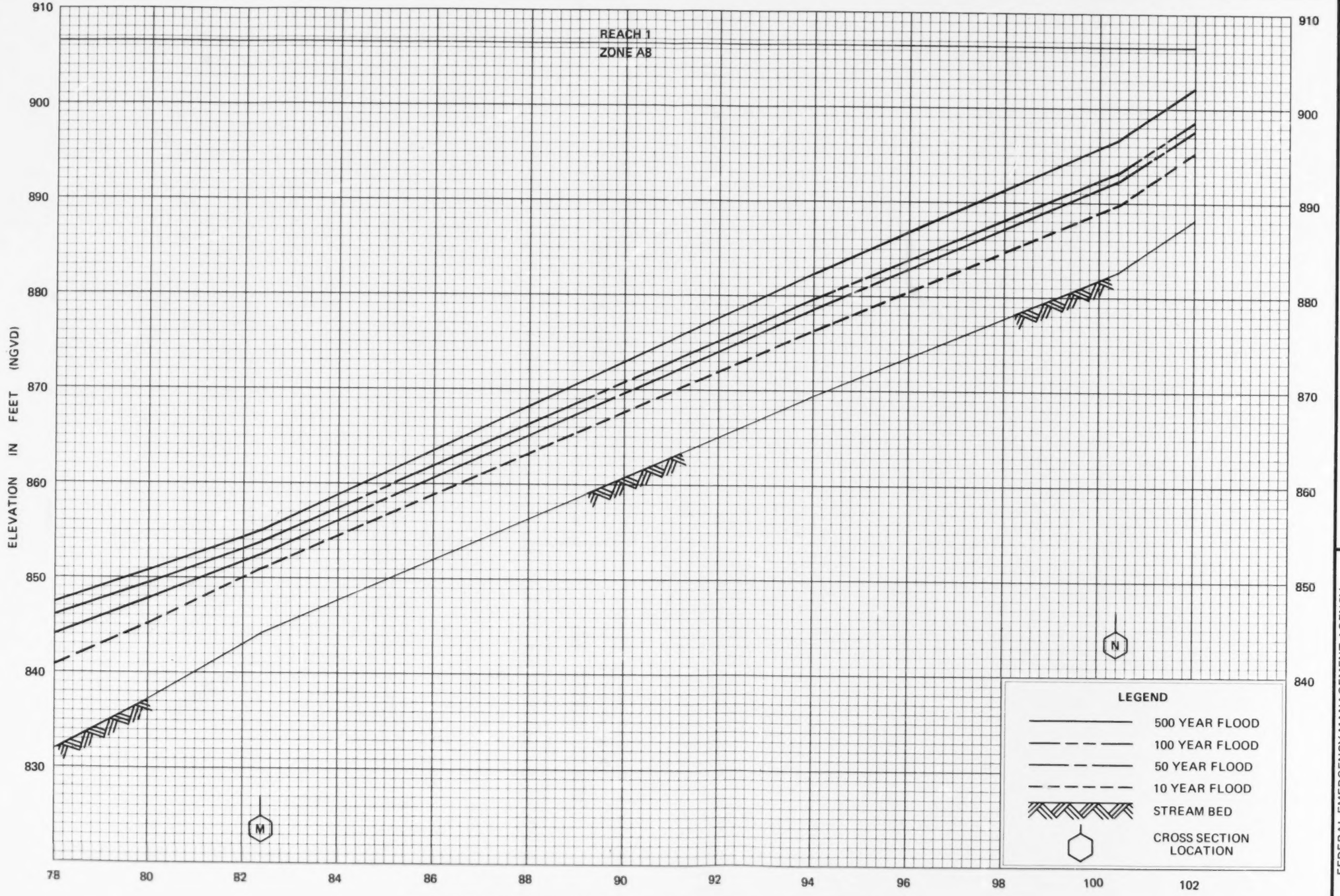

FLOOD PROFILES

BALL MOUNTAIN BROOK

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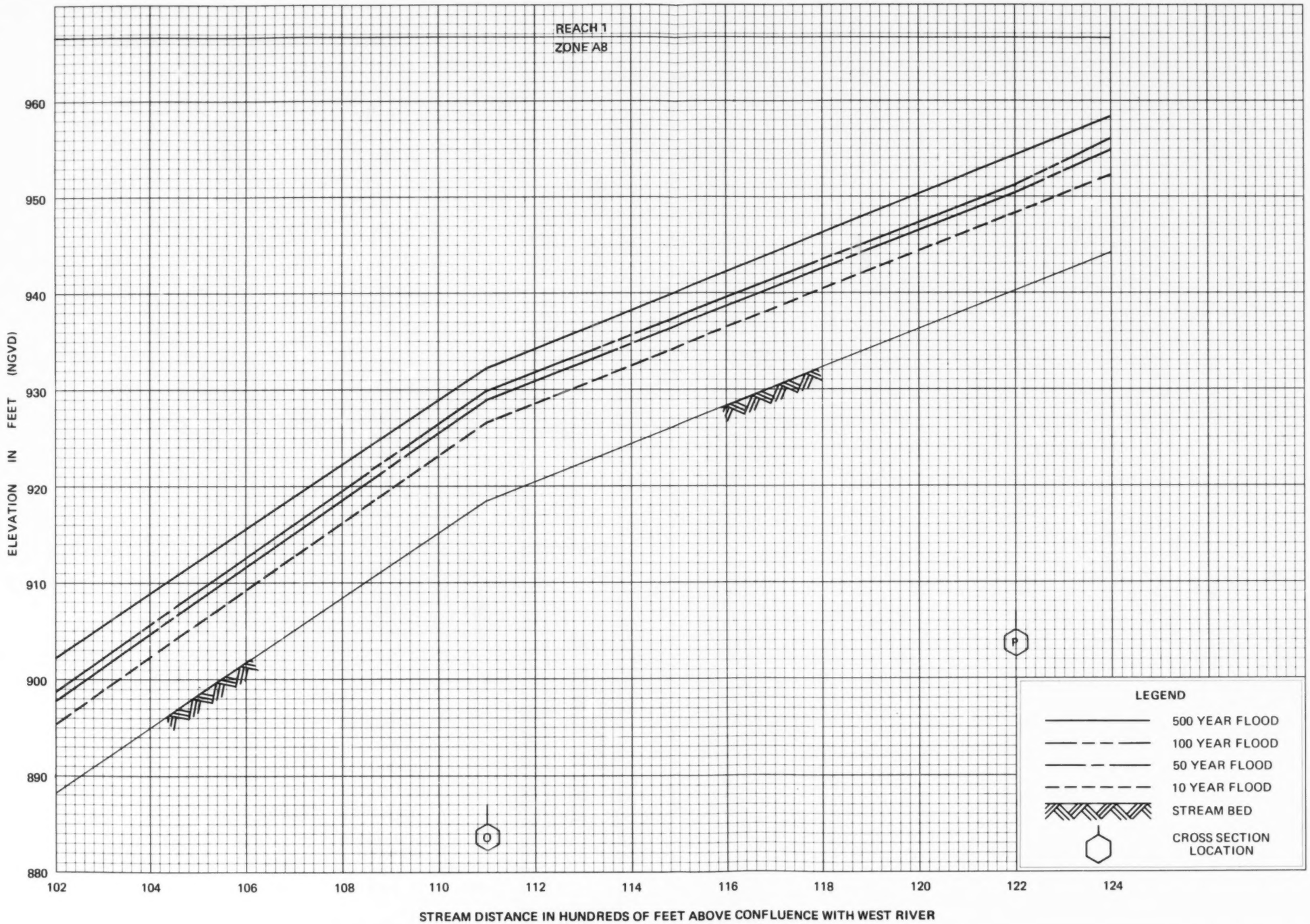

FLOOD PROFILES

BALL MOUNTAIN BROOK

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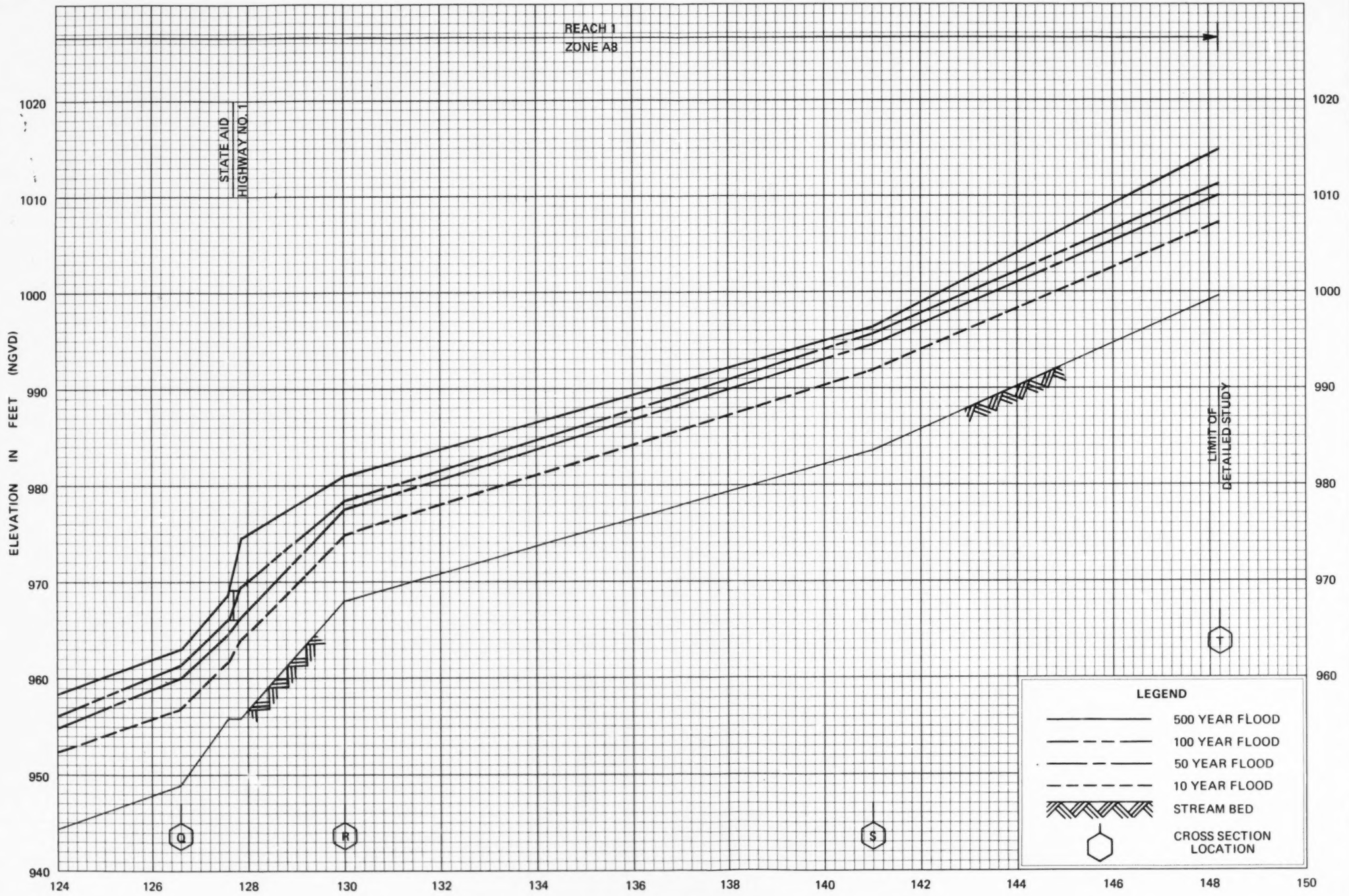

FLOOD PROFILES

BALL MOUNTAIN BROOK

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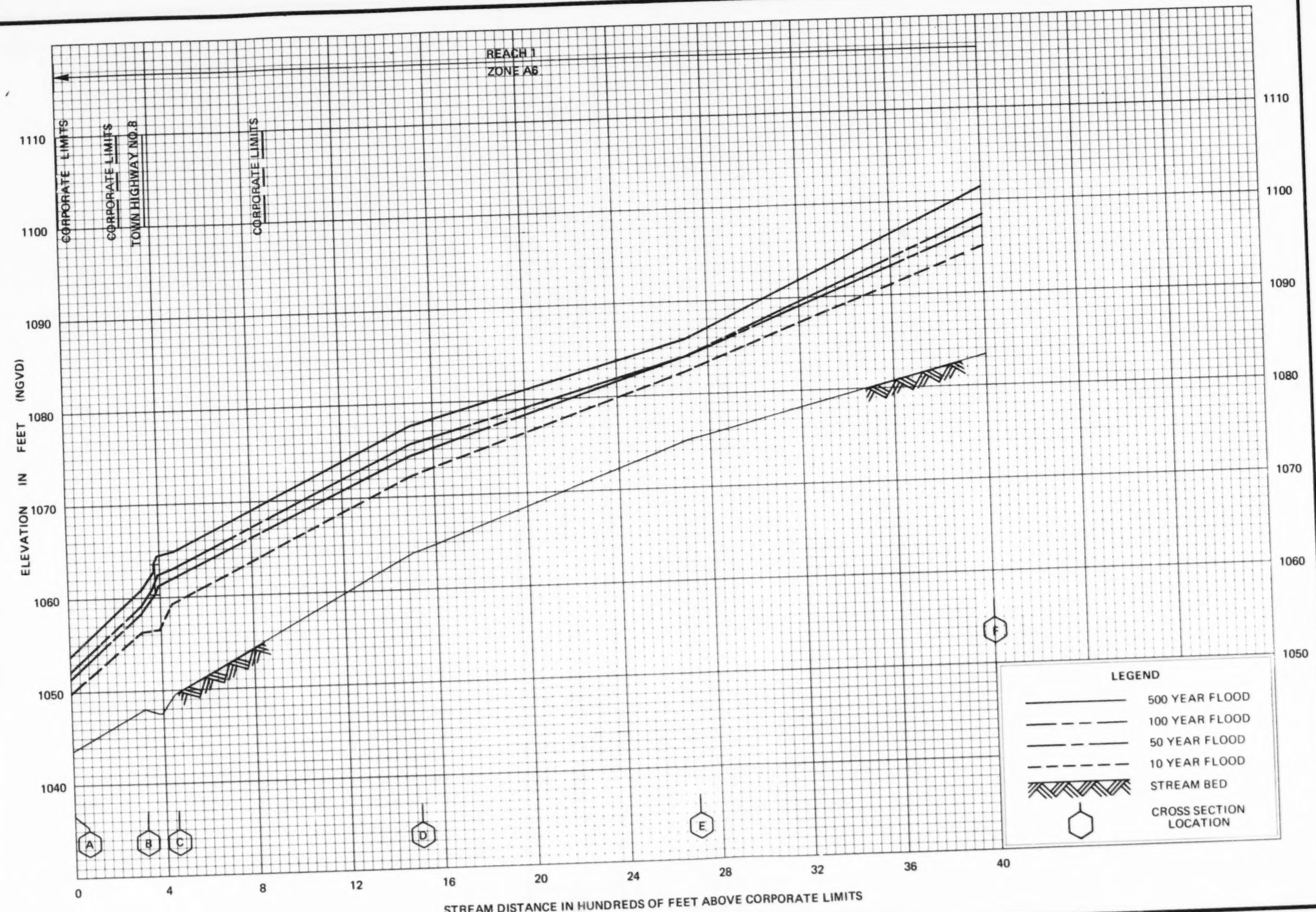

FLOOD PROFILES

WINHALL RIVER

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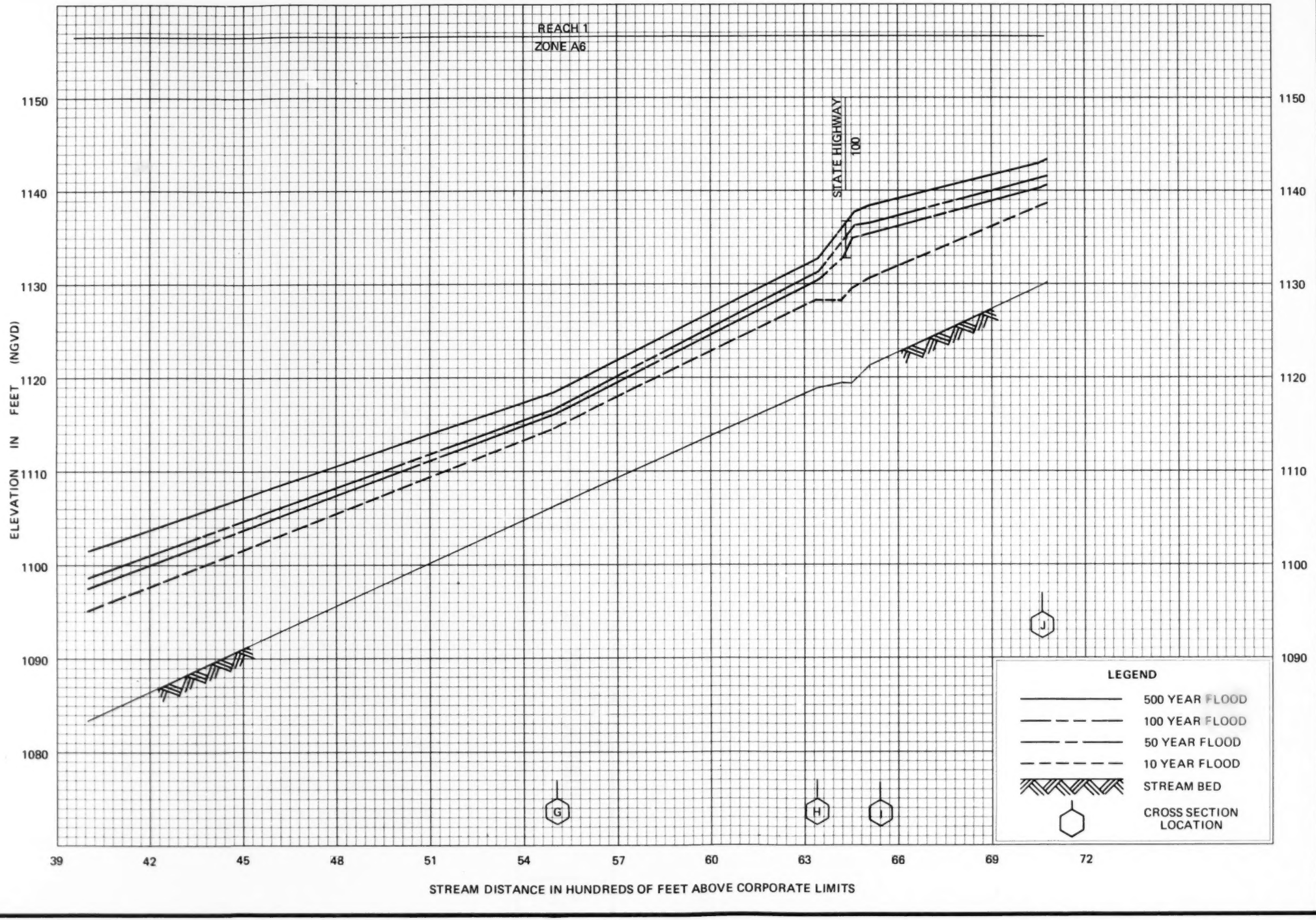

FLOOD PROFILES

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(WINDHAM CO.)

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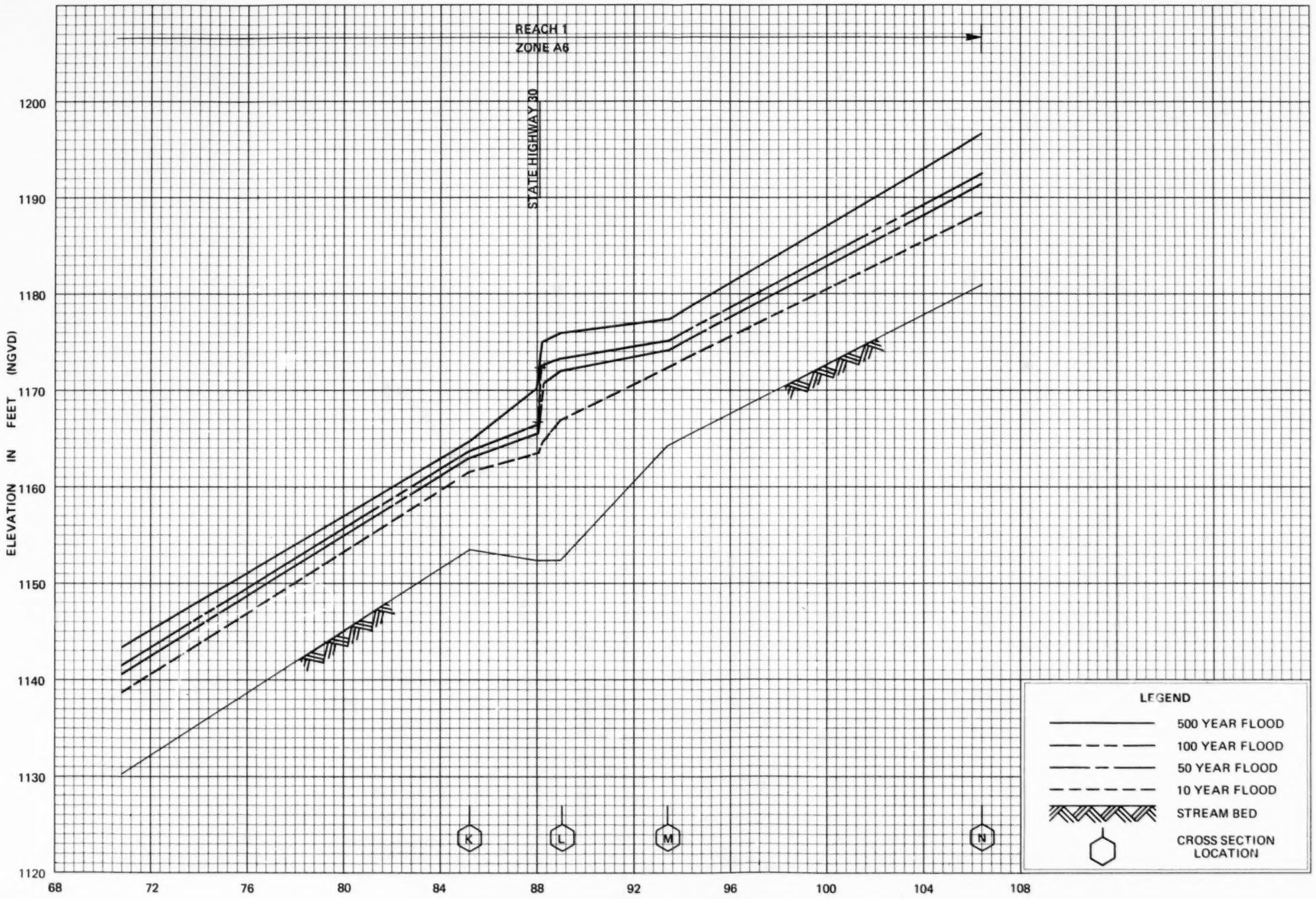

FLOOD PROFILES

WINHALL RIVER

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TOWN OF JAMAICA, VT
(WINDHAM CO.)

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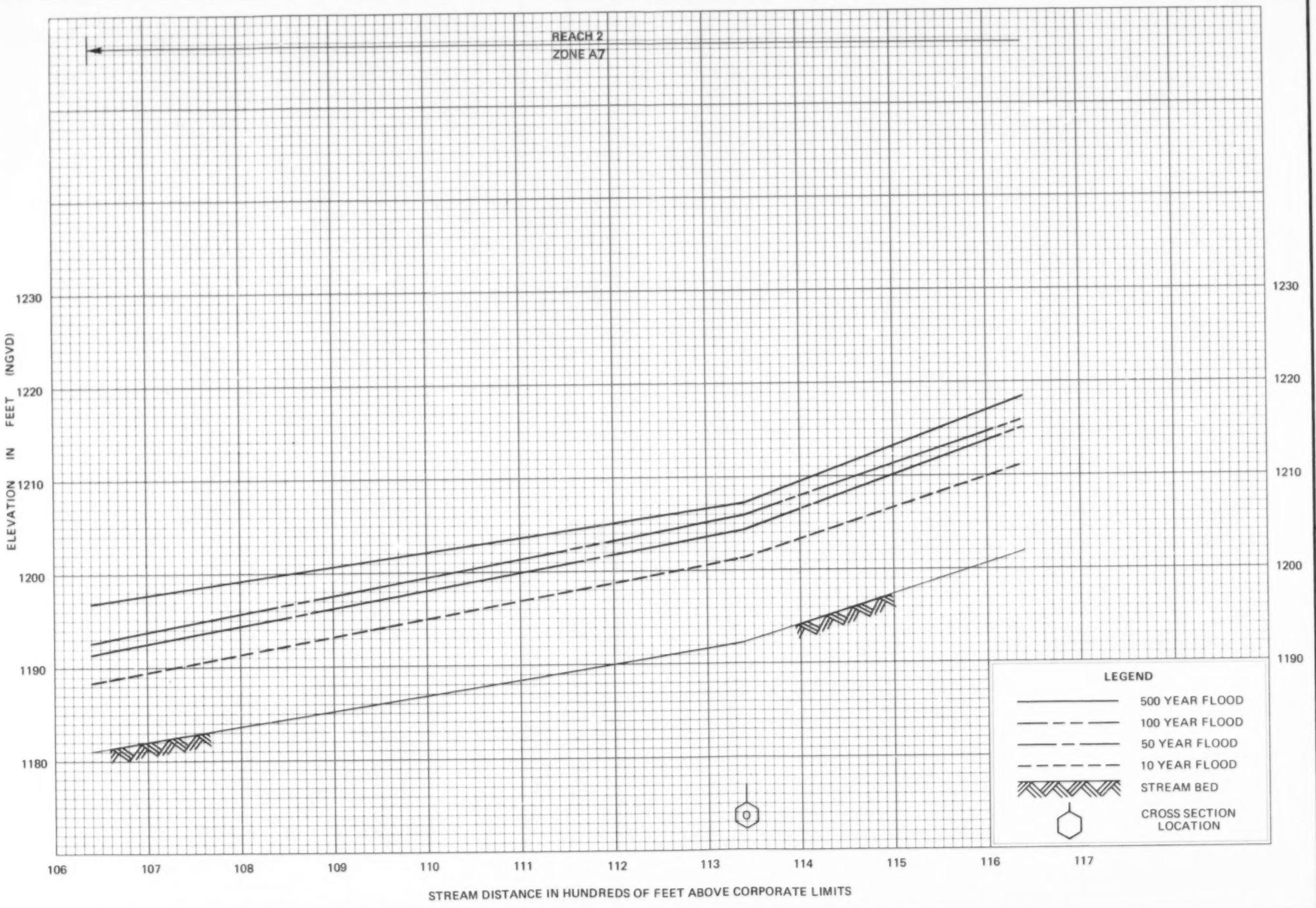

FLOOD PROFILES

WINHALL RIVER

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Federal Insurance Administration

TOWN OF JAMAICA, VT
(WINDHAM CO.)

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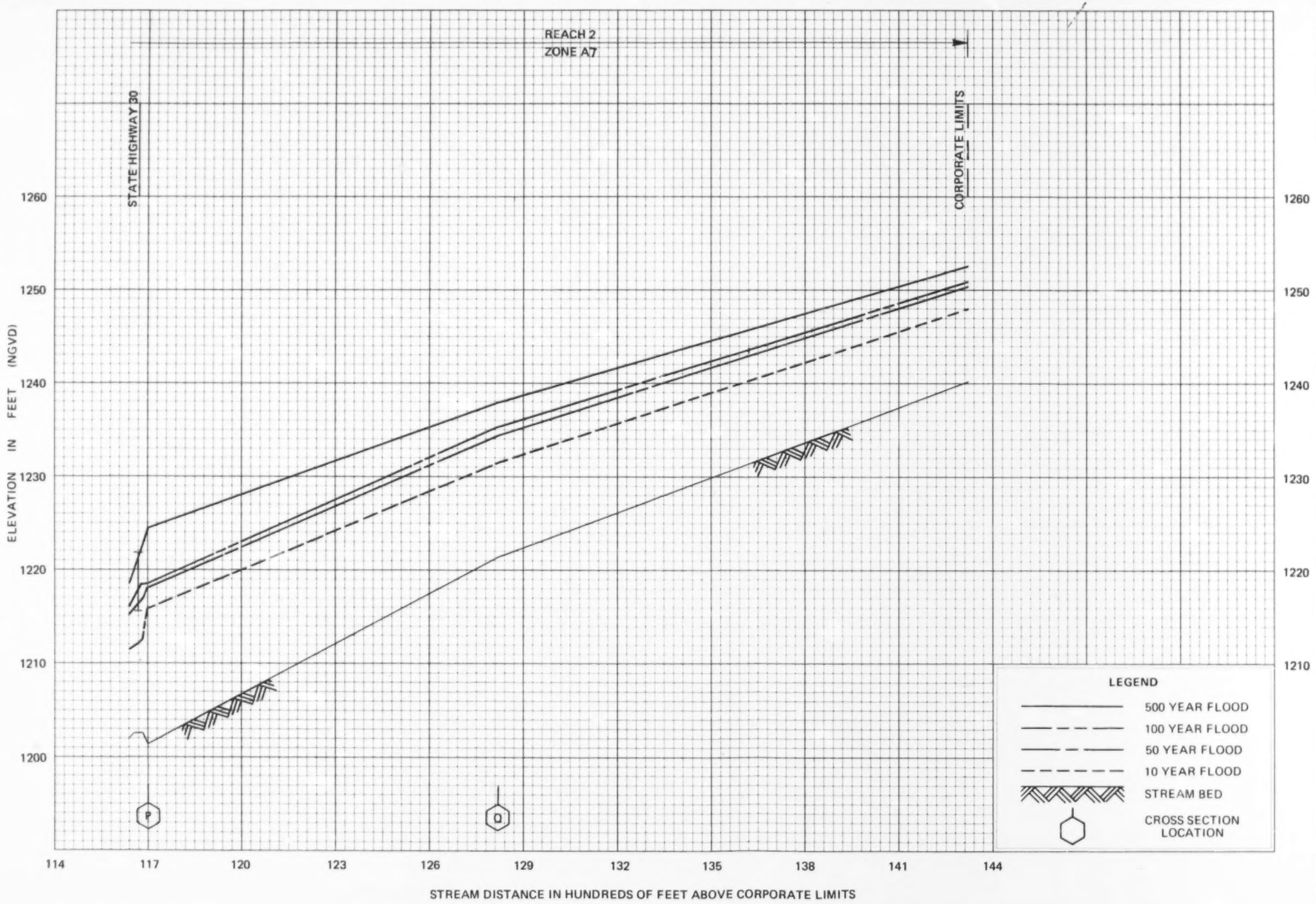

FLOOD PROFILES

WINHALL RIVER

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Federal Insurance Administration

TOWN OF JAMAICA, VT
(WINDHAM CO.)

23P